

ABSTRACT

Broadband Wireless (BWA) is a wireless technology that is capable of providing high speed data service quality of the single user and multi user system. One of the reliable products of BWA technologies is Worldwide Interoperability for Microwave Access (WiMAX). WiMAX technology is also required to maintain quality of service on channel propagation changing which it can be causing a reduction in data rate and increases Bit Error Rate (BER). On development, WiMAX can be categorized into two, there are fixed WiMAX and mobile WiMAX .

Based on the above issue, this final project is simulated using subchannelization technique for allocating subcarriers based on number of users . The subchannelization technique used are PUSC (Partial Usage Subcarrier) and FUSC (Full Usage Subcarrier). Another hand, implementation of Adaptive Modulation and Coding techniques are expected to maintain the quality of services to solve multipath channel changing in particular the data rate services at high speed.

In final project will be analyzed of performance by using of PUSC and FUSC techniques when AMC (Adaptive Modulation and Coding) in WiMAX 802.16e. Type of modulation used are QPSK , 16 - QAM and 64 - QAM . While the channel coding used are convolutional code with rate 1/2 and convolutional turbo code with rate 1/3. The final project is simulated with variation the number of users (1,4,8 and 16 users) and speeds (3 km/h and 120 km/h) . The result of simulation single user and multi user system, FUSC give repairmen for PUSC on a target BER of 10^{-3} at a speed of 3 km/h is $\pm 76 \%$. While at a speed of 120 km/h FUSC give performances for $\pm 84 \%$. Implementation of AMC (Adaptive Modulation and Coding) with FUSC, data rate can be increased up to 80 Mbps at single user, 20 Mbps at 4 users, 10 Mbps at 8 users and 5 Mbps at 16 users. While the increase of data rate on PUSC, at system single user, 4 users, 8 users and 16 users respectively up to 75 Mbps, 18.75 Mbps, 9,38 Mbps and 4.69 Mbps. So both of FUSC and PUSC in single user system can be categorized super high multimedia class based on standards of IMT Advanced.

Keywords: Mobile WiMAX PUSC , FUSC , AMC (Adaptive Modulation and Coding)